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DESCRIPTION

Title of the invention:

FOUR WHEEL MECHANICAL BRAKE SYSTEM FOR INLINE SKATES

BACKGROUND ART

This invention relates to a brake system for inline skates and seeks to improve the inline skaters stability when braking, and also to provide smooth and effective braking.

Inline skate brakes presently in use are almost exclusively limited to a piece of rubber mounted behind the heel of one of the skates.

In order to brake, the skater has to lift the front of the skate thus having only one wheel rolling on the ground while pushing the rubber piece to the ground.

Rolling on one wheel with one skate becomes an unstable position. This instability is further increased when scraping the rubber piece on the ground.

One improved brake system uses a lever device to push the rubber piece to the ground when the lower leg is straightened without having to lift the front of the skate, thus rolling on all wheels, greatly improving stability, but still having rough and ineffective braking.

DISCLOSURE OF THE INVENTION

This invention seeks to provide smooth and effective braking on one or both skates without having to lift the front of the skate off the ground.

By utilizing a pivoting ankle support as a trigger mechanism for the brake, the brake is applied when the skater straightens the leg into a "braking position." The exact angle of the leg when the brake is applied is adjustable with the threaded, spring-loaded trigger rod behind the heel.

A brake lever extends from behind the heel on both sides of the frame towards the front where it is hingedly attached to the frame.

At the mid-point of the skate the brake lever is hingedly attached to a bracket that is connected to the brake rail which extends the whole length from the first to the last wheel above the wheels, where it is held in position a short distance from the wheels by a return spring behind the heel that pushes the brake lever and brake rail upwards.

The brake rail is securely centered by two brackets extending downwards from the underside of the skate passing through slots in both ends of the brake rail.

When braking the skater straightens the leg to a predetermined adjustable position causing the lower end of the spring-loaded trigger rod to push the brake lever downwards, which in turn causes the brake rail to contact the wheels generating friction, and thus braking on all wheels in direct proportion to the force applied when the leg is straightened.

The spring loading of the trigger rod is necessary in order to accomplish smooth and easily controllable braking.

The spring tension is adjustable so that maximum braking can be achieved for skaters with different body weights without the wheels locking up and skidding.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an elevational view of an inline skate with the herein described "four wheel mechanical brake system" disengaged.

Fig. 2 is an enlarged portion of **Fig. 1** showing greater clarity of detail of the trigger assembly.

Fig. 3 is the upper portion of a section taken on **A-A** of **Fig. 1**.

Fig. 4 is a plan view of the brake rail with the bracket required for connecting the brake rail to the brake lever mounted on the brake rail.

BEST MODE FOR CARRYING OUT THE INVENTION

In **Figure 1, 5** indicates an elevational side view of an inline skate with the herein described "four wheel mechanical brake system" disengaged.

1, 2, 3 and **4** indicate the skate wheels.

6 is the pivoting ankle support.

6A is the pivot point.

See **Fig. 2** for greater clarity of detail of the trigger assembly.

7 is a lengthwise sectional view of the trigger assembly.

8 is the trigger rod.

8A is the adjustment knob of the trigger rod.

8B is the threaded lower portion of the trigger rod. The arrow **8C** indicates the direction of movement of the trigger rod, when the trigger spring **10** becomes somewhat compressed during braking.

9 is the mounting bracket for the trigger assembly.

10 is the trigger spring.

11 is the trigger spring adjustment nut.

11A is the center hole in the trigger spring adjustment nut that accommodates the vertical movement of the trigger rod **8**.

12 is the tubular spring housing.

12A is a hole in the bottom of the spring housing for the trigger rod.

13 is the trigger rod adjustment slide with the center hole threaded for trigger rod adjustments.

14 is the rotational stop screw for the trigger rod adjustment slide.

12C is a slot in the trigger spring housing to accommodate the vertical movement of the stop screw **14** when braking.

15 is the brake lever.

15A is a horizontal shelf connecting the right and left side of the brake lever.

15B is the hinged attachment to the skate frame.

15C is the hinged attachment to the bracket **19** that connects the brake lever **15** and the brake rail **18**.

15D is a view of the rearmost portion of the brake lever with a piece of the right side cut off.

16 is the return spring for the brake lever **15** and brake rail **18**.

16A is the mounting bracket for the return spring.

17 is the centering guide brackets for the brake rail **18**.

19 is the bracket that connects the brake lever **15** and the brake rail **18**.

Figure 3 is a sectional view of the upper portion of a section taken at **A-A** in **Fig. 1**.

15 is the brake lever.

18 is the brake rail.

19 is a bracket attached to the brake rail that connects the brake lever **15** and the brake rail **18**.

20 is the bolt and nut connecting the brake lever **15** and the bracket **19**.

21 is a broken outline of the skate wheels indicating the position of the skate wheels relative to the brake rail **18** in a disengaged position.

22 is the skate frame.

Figure 4 is a plan view of the top side of the brake rail **18** with the bracket **19** attached.

18A are the slots in the brake rail that accommodates the centering guide brackets **17** (See **Fig. 1**).

The brake is applied by the skater straightening the leg or legs if both skates are equipped with brakes, to a predetermined adjustable position.

The exact angle of the leg when the skater wants to apply the brake is determined by adjusting the trigger rod up or down with the adjustment knob **8A**. Wheel wear is also compensated for by the trigger rod adjustment.

The straightening of the leg causes a downward movement of the whole trigger assembly **7** mounted behind the heel on the pivoting ankle support **6**.

When braking, the lower end of the trigger rod **8** contacts the horizontal shelf **15A** of the brake lever **15** and pushes it downwards as it hinges at **15B**.

This in turn causes the brake rail **18** to be pushed against the skate wheels because of the hinged attachment to the brake lever **15** at the mid-point of the skate through the connecting bracket **19**.

Braking power is directly proportionate to the force applied by the skater when straightening the leg.

In order to accomplish smooth and controllable braking the trigger rod **8** is spring-loaded by the trigger spring **10**.

Spring tension is adjustable with the trigger spring adjustment nut **11**, so that skaters with different body weights can achieve optimum braking without the wheels locking up.

When not braking the brake lever **15**, and thereby the brake rail **18** is held in the disengaged position by the brake lever and brake rail return spring **16**.

The brake lever and brake rail return spring **16** is a weaker spring than the trigger spring **10** which causes the downward movement of the brake lever **15** and brake rail **18** when braking.

The inflexible brake rail **18** conforming to the shape of the periphery of the skate wheels (see **Fig. 3**) facilitates even wheel wear both regarding the shape of the wheel's contact area with the ground and their diameter.

The brake rail **18** is securely centered in position by two brackets **17** (see **Fig. 1**) extending downwards from the underside of the skate passing through slots **18A** (see **Fig. 4**) in both ends of the brake rail **18**.

Somewhat increased wheel wear is, of course, an unavoidable fact with this brake system, very much depending on the amount and intensity of braking done by the skater.

This brake system is not intended to extend the use of skates from presently relatively flat ground to steeper roadways, since excessive friction heat build-up in the brake rail would be very damaging to the wheels.

However, for safety and convenience, and as encouragement to beginner skaters to take up the sport it could be very useful and potentially trigger a renewed popularity boom for inline skating.